

In Fig. 5 the cystocarps and sphaerospores, in different degrees of development, are represented.

Two other genera at present but little known, namely, *Marchesettia* (Hauck) and *Melanoseris* (Zan.), are also commented on. The former is a most singular alga, in appearance much more like a branched sponge than a plant, and, except for the little deep-red fruit-leaflets, it might readily be taken for one. The discovery of the fruit shows that its affinities are with *Thamnoclonium*. One of the several new species of this genus, described in the present work, so much resembles *Marchesettia*, that it has been named *T. Marchesettoides*.

The other genus, *Melanoseris*, is nearly related to *Pollexfenia*, from which it is distinguished by the fruit in the former being marginal, instead of on the disk, as in the latter, and by its smaller size.

*Halymenia saccata* (Harv. and H. "Fl. Tasm.") has long been a puzzle to algologists. Dr. Agardh now refers it to *Bindera*, supporting his opinion by a comparison of the structure and fruit with those of *Bindera splachnoides* (see pp. 41-46, and Fig. 3).

Another plant, *Amansia? Marchantioides*, first mentioned in the "Flora of New Zealand," had not, hitherto, been accurately determined. Dr. Agardh now considers it to be a *Placophora*.

Among the more interesting of the new species is *Cliftonæa imbricata*, of which one specimen only has yet been discovered. This was also the case with *C. semipennata*, of which one example only is known to exist.

The present work is illustrated by one plate. The eight figures are printed in a red ink, which is somewhat dazzling to the eyes.

In conclusion, we venture to suggest that *Gracilaria Millardetii* (p. 64) should be *G. Maillardetii*, the plant having been named by Montagne *Rhodymenia Maillardetii*, in honour of M. Maillard, the author of "Notes sur l'Île de Réunion."

#### OUR BOOK SHELF

*Practical Chemistry, with Notes and Questions on Theoretical Chemistry.* By William Ripper, Assistant Professor of Mechanical Engineering, Sheffield Technical School. Second Edition. (London: Isbister and Co., 1885.)

TRULY the number of little books coming into existence, presumably to aid students to do the Science and Art Department's examinations, is very great, and they are not by any means always good. The evil of a big book has evidently been well seen by chemical teachers, and more especially by teachers connected with the Department's examinations, many little books springing up intended originally for the class or school to which the teacher is attached only. In some, the greater number of cases perhaps, this is a very happy thing for students in general. When a book of this kind passes through two editions in a reasonably short time there is some cause for its survival. The book before us has evidently fulfilled its mission in a fairly satisfactory manner. It is still decidedly one of the cramming class, but it contains an amount of matter simply and well arranged which, with the aid of a teacher, or demonstrations, should enable any ordinarily industrious student to "pass" the first stage of the "Department's" examinations.

The first part contains descriptions of experiments on the non-metallic elements, reactions for metals and acids, and tables for the examination of a simple salt. The

second part, called "Theoretical Chemistry," is mostly equations, and questions and problems.

*Free Public Libraries; their Organisation, Uses, and Management.* By Thomas Greenwood, F.R.G.S. (London: Simpkin, Marshall, and Co., 1886.)

IF in Her Majesty's dominions there is a spot where newspapers do not penetrate and where free libraries are only known by name, and yet where some pioneering spirit only requires a spark to set aflame the desire to start such an institution, this book will be a fitting flint and steel for the purpose. But as such a combination is to be found in very few places, we cannot encourage the writer to hope that many will read his 500 pages of newspaper cuttings with much satisfaction. To any reader who is within measurable distance of earnestly considering that "most interesting question of the day—how to work a free library in a small community"—nineteenths of this book, commencing its survey as it does at the British Museum, will be provokingly irrelevant; he will grudge the time taken up in finding where the practical information is scattered. As a missionary book, crying in the wilderness the advent of knowledge, it is less likely to make its way than the newspapers from which it is compiled, and it is thoroughly wanting in the eloquent earnestness of the prophet.

Still there is much excellent advice to those who know nothing about the matter; and since it seems to have been written, as the compiler says, "with the earnest hope of increasing the number of free libraries" (there are 133 now open in Great Britain) we gladly call to it the attention of any to whom such a book as we describe may be useful. The combination in the writer of librarian and newspaper editor has made easy to him much that would have been a considerable labour to others who might have gone more deeply into the subject, and his information is brought down to marvellously recent date.

The hasty way in which it has been put together is illustrated by an account on p. 83 of "first failures," which apparently apply to Sheffield, and are not discovered to belong to Newcastle-upon-Tyne till three pages further on there comes a full-page engraving of the important building opened there in 1884 by the Prince of Wales. A puzzled reader may guess that a short paragraph on p. 100 should have introduced its history, but that it found its present place among the author's notes through confusion of the name with that of Newcastle-under-Lyme. The same haste appears in more important matters. Mr. Greenwood very properly urges the importance of the librarian as the "vocal key to the catalogues," and gives a touching illustration of the value of knowledge and sympathy in that officer. "Wives and children come for books, and make the request, 'Please pick me a nice one, sir, for if I take home an interesting book, my husband (or father, as the case may be) will stop in during the evening and read it to us.'" We must point out the inconsistency between this and the unqualified advice he gives to the librarian not to stand "at the desk entering out and taking in the books, and so uselessly employed in doing the work of a boy." It will be found that as such a librarian stands at the counter and hears the wants expressed of the class for whose benefit chiefly these libraries are considered to be established, the circulation of books will increase; while if it is left to a boy to do the work, the popularity, the circulation, and to a far greater extent the good work, of a free library will fall off. The same consideration also should qualify the zeal with which the use of indicators is urged, which, though theoretically very simple, and to the library officials very time-saving things, yet practically do not work where any attempt is made to accommodate the class just referred to, or an unlearned public who, it will be found, won't use catalogues. For one minute, however, which they save the librarian, they hinder five

minutes of the borrower of the more intelligent class; to whom, also, the most recent catalogue (and hence the indicator) is generally deficient of three-fourths of the books he most wants, viz. the new ones.

Nothing is better than the advice given here to secure a good librarian even at a higher cost than some may consider proportionate to the income. But the committee having taken that advice, there is little in this book which will be of value to either him or them. W. ODELL

*Les Aérostats dirigeables.* Par B. de Grilleau. (Paris: Dentu, 1884.)

THIS little book does not add anything to the scientific data regarding the direction of balloons which we have lately published; indeed it was written before the best and most conclusive trials were made. It is a popular view of the subject only; but it is useful as combating the ignorant prejudice existing thereon in the public mind. It points out to whom the successful solution of the problem is due; it states the results that have been obtained, and it shows what may be expected to be done in the future. It also explains clearly some of the conditions affecting the question, which are often misunderstood, such as the effect of the wind, the effective speed obtainable, the nature of the propelling action, and so on.

#### LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.]

#### Clifford's "Mathematical Fragments"

A SHORT time since I lent the originals of this work to Mr. A. B. Kempe, F.R.S., as he has been working on the subject of "graphs." Some remarks he made on returning the "Fragments" led me to compare them with the lithographed work, and I propose to supply what is, I think, a defect in the published book.

The "Mathematical Fragments" are reproduced on xxii. pages of a uniform size which in the original manuscript is that of the first 5 pages only. The paper of these pages is blue, and has ruled lines. Page vi. corresponds to two pages of manuscript, indicated by a break, two other pages being blank. Page vii. corresponds to two distinct pages of manuscript. Page viii. is made up of three parts, the first six lines on one page of manuscript, the next thirteen of another page of manuscript. These last pages of plain white paper are approximately  $4\frac{1}{2}$  inches wide by  $5\frac{1}{2}$  inches deep. The page is filled up with a fragment on plain blue paper approximately  $5\frac{1}{4}$  by 8 inches. Page ix. is on stout plain white paper, app. 7 inches by 9 inches. The last five lines of book are written on the back of the paper. Pages x.-xvi., xviii.-xxi. are written on thin white paper of the same material as page vi., size 9 inches by 11 inches; the pages are all detached; page 15 is on back of page 14, and page 19 on back of page 18. Page xx. is made up of two distinct pages of manuscript, the second commencing at the defaced word which is clearly in the manuscript "Degree." Page xvii. is written in pencil on stiff white paper, folded in half, the lower fragment in the manuscript being in the lower half of the page, and at right angles to the upper—size of full page, app. 7 inches by 10 inches. Page xxii. is made up of three pages of manuscript: the uppermost fragment is on white paper, 6 inches by 4 inches; the immediately following four lines of writing are given on the back of this page. The next three lines are on paper 7 inches by 10 inches, and the last four lines on precisely similar paper. The time notes at the side have, of course, nothing to do with "graphs."

These "Fragments" have been circulated (see "Papers," p. 286) chiefly amongst libraries; if the details I here supply are indicated in the copies, their value will, I believe, be greatly increased, and much trouble may be saved by students when

they know how slender a connection there is in some cases between consecutive pages of the text. In the manuscript there is no indication of the order in which the pages should be read beyond what I have pointed out above. The manuscripts are now deposited in the Library of University College, Gower Street. R. TUCKER

#### The Upper Wind Currents in the South Indian Ocean and over the N.W. Monsoon

AFTER sending a brief account to NATURE of my observations on the upper wind currents over the Atlantic doldrums, I started from Natal for some journeys across various portions of the Indian Ocean, to investigate the circulation of the higher atmosphere in that region.

I first went to Mauritius. During the whole passage from Natal, at the end of December, we sailed in the S.E. Trade, with an almost constant movement of high cirrus from the N.W.

Though I was disappointed in not meeting with a cyclone in those seas, still I succeeded in obtaining much valuable information about the details of hurricane weather, which could only be learnt on the spot. One point relating to upper currents is very important. The cirrus which appears five or six days before the arrival of a hurricane follows the normal course from N.W. or S.W., and is no guide to the path of the cyclone. But on the outskirts of the hurricane, low clouds afford valuable information. If the cloud over the S.E. surface-wind inclines towards E. the centre of the cyclone will pass to the N.; if on the contrary the low cloud inclines towards S. the centre will pass to the S. of the observer.

Though Meldrum, and Bridet of Réunion, both agree on this point, the subject requires further elucidation, for such a rotation of upper currents is contrary to all analogy of what is supposed to hold round cyclones in the northern temperate regions. I am certain from my own investigations that the general character of tropical and extra-tropical cyclones is identical. In Mauritius hurricanes I find the same oval form, the same squall at the turn of the barometer, the same halo in front, and hard, detached cloud in rear, which characterise European cyclones. Mr. Harris has recently traced a cyclone from its easterly course as a typhoon in the China Seas, across the Pacific, United States, and Atlantic into Western Europe. Like every other long-lived cyclone, this one received accessions of strength by fusion or coalescence with others which had formed outside the tropics. It is perfectly certain that cyclones which revolved on different systems could not unite, and I think that the motion of the lower layers of cloud over the northern side of our own cyclones should receive special attention. At present we are led to believe that the cirrus in front of a cyclone, both right and left of the path, comes from S.W. or S.

Be this as it may, cloud motion forms a useful adjunct to a valuable and successful system of hurricane forecasting that is carried out by Mr. Meldrum, who, in the absence of telegraphs, has to rely entirely on his own instruments and above all on his own experience and judgment. Another interesting feature of this system is the care which must be taken to allow for the diurnal motion of the barometer during the slow diminution of pressure which always precedes the arrival of a hurricane.

From Mauritius I sailed to Adelaide, so as to examine the Polar limit of the S.E. Trade. Though we steered a great circle course which took us fully into  $39^{\circ}$  S. latitude, we experienced constant S.E. and E. winds. These must have been due to some extra-tropical anticyclone, and every observation of low or middle layers of cloud showed a current practically in the same direction as the surface-wind.

At Adelaide I learnt that the normal direction of the highest currents is from N.W. In that city the direction of the surface-wind is much influenced by land and sea breezes. Through the kindness of the acting chief of the Observatory, Mr. W. E. Cooke, I was able to confirm what I had previously suspected from my investigations in Melbourne last year, that sometimes at least the characteristic "southerly bursters" of Australia, are due to that class of V-shaped depression in which the rain occurs in rear of the disturbance. Other times the sudden irruption of S. wind appears due to the shift of wind at the passage of the trough of a cyclone.

From Adelaide I came here to Colombo so as to repeat a section of Indian Ocean very nearly at the same season and in the same straight line as last year. The results of the former voyage were communicated to NATURE, vol. xxxii. p. 624, when I announced the fact that the highest currents over the